

Opportunities for Heat Island Measures in Air Quality Planning

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Overview

- Background on Air Quality Planning
- Recent EPA Guidance
- Applicability of Heat Island Measures

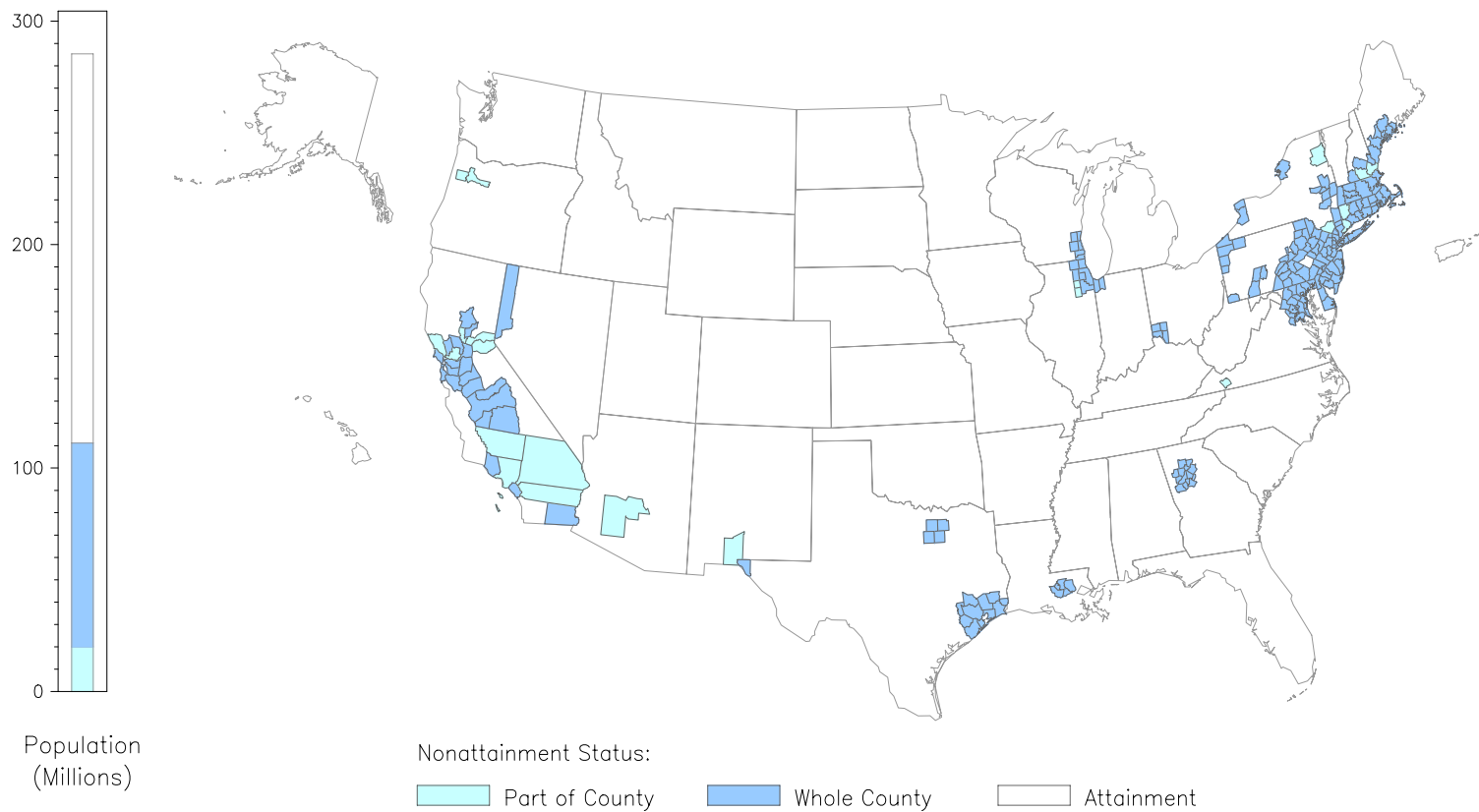
Backdrop: New Air Quality Standards

- New Air Quality Standards
 - More areas affected
 - More reductions required
 - Many “low hanging fruit” measures have been already picked

1-hour Ozone Nonattainment Areas

Nonattainment Areas Map – Ozone (1-hour)
United States

AirData



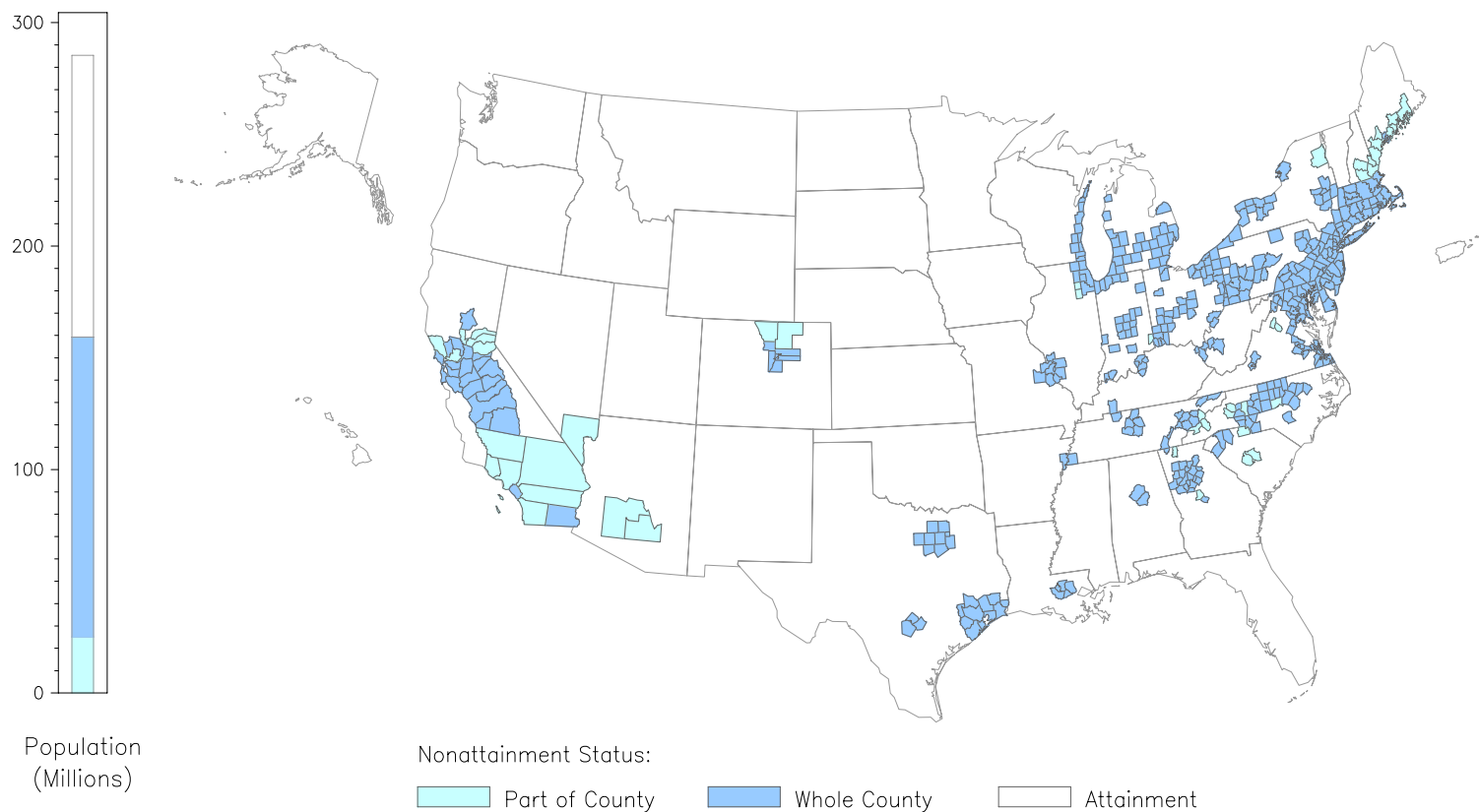
Source: US EPA Office of Air and Radiation, AQS Database

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NEW 8-hour Ozone Nonattainment Areas

Nonattainment Areas Map – Ozone (8-hour)
United States

AirData



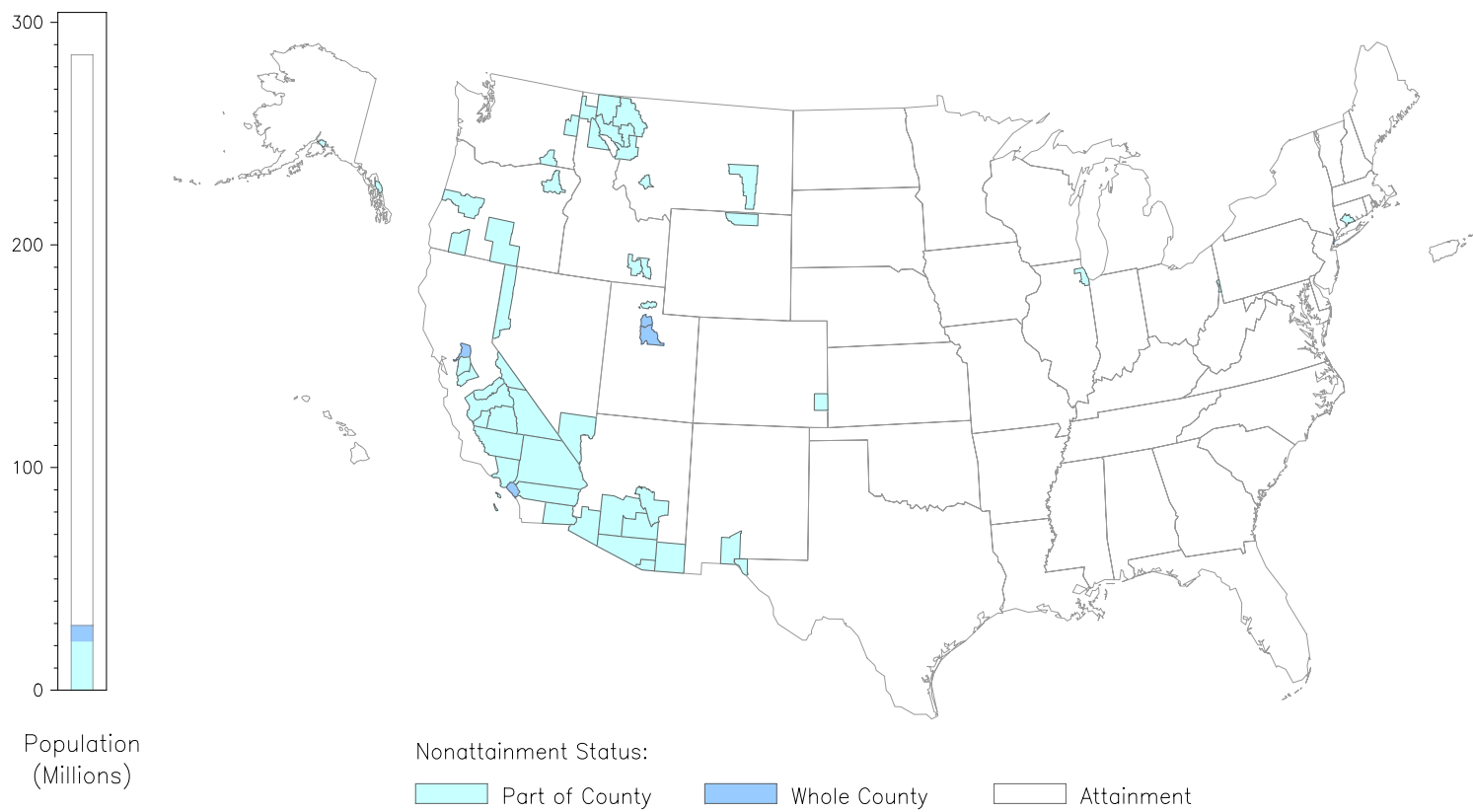
Source: US EPA Office of Air and Radiation, AQS Database

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PM 10 Nonattainment Areas

Nonattainment Areas Map – Particulate (size < 10 micrometers)
United States

AirData



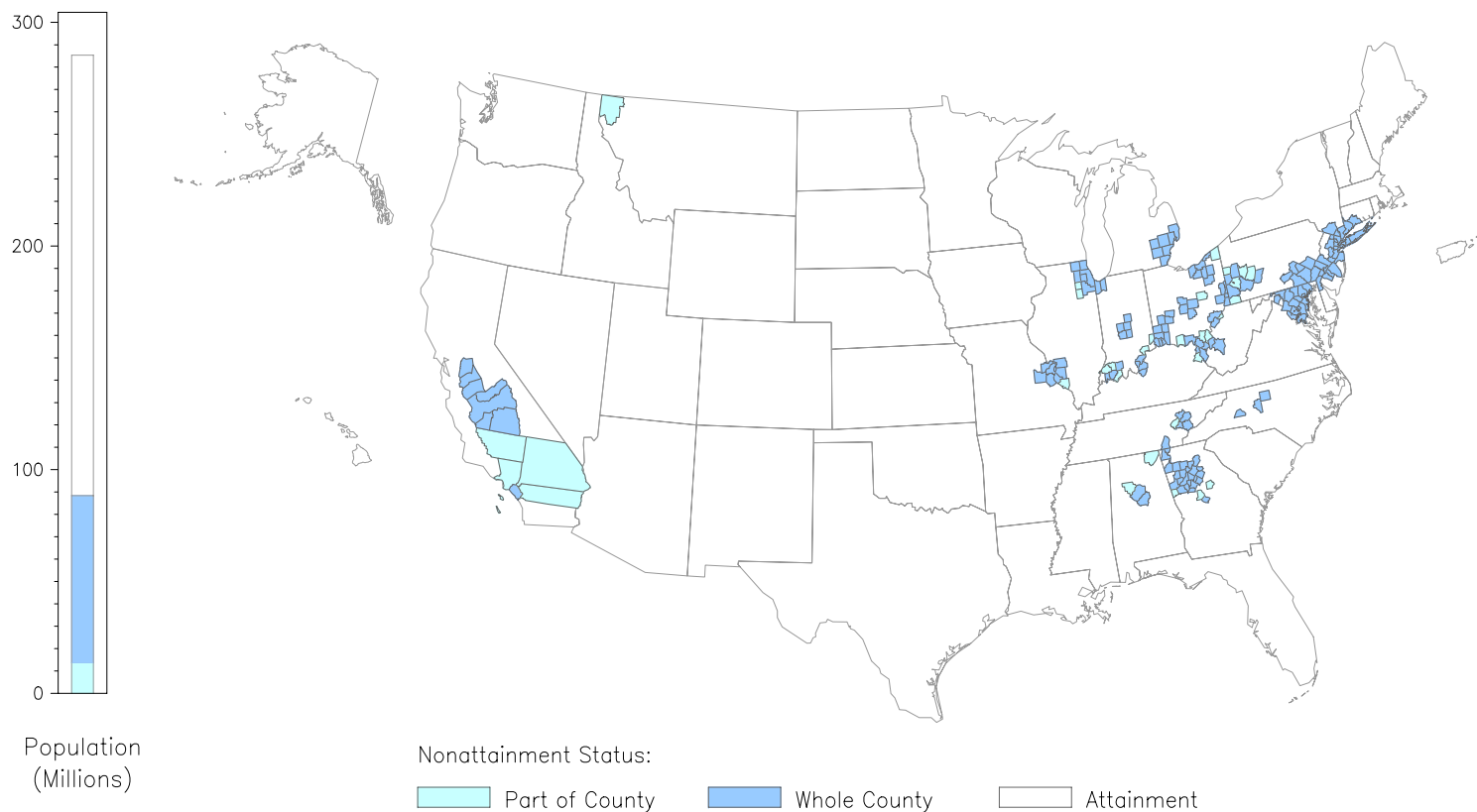
Source: US EPA Office of Air and Radiation, AQS Database

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NEW PM 2.5 Nonattainment Areas

Nonattainment Areas Map – Particulate (size < 2.5 micrometers)
United States

AirData



Source: US EPA Office of Air and Radiation, AQS Database

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New EPA Guidance

- Guidance on SIP Credits from Energy Efficiency and Renewable Energy Measures
 - August 2004
- A Toolkit for States: Using Supplemental Environmental Projects to Promote Energy Efficiency and Renewable Energy
 - January 2005
- *Bundled Measures Policy*
 - *Summer 2005*

Umbrella Policy – Emerging & Voluntary Measures Policy – 9/05

- Applies to Stationary and Area Sources (not mobile)
- Voluntary Measure is:
 - Not enforceable against a source
 - “Enforceable” against the state (if shortfall, state responsible for making up)
- Emerging Measure is:
 - Less certain than a traditional measure in quantification
 - Granted “provisional” credit until validated

Voluntary & Emerging Measures Policy (continued)

- A particular measure can be both “voluntary” and “emerging”
- A 6% presumptive limit on all voluntary and emerging measures
 - I.e. 6% of total reductions needed for SIP (e.g. ROP, attainment, etc.)

Voluntary & Emerging Measures Policy (continued)

- SIP Measure requirements:
- Surplus – (cap and trade) (baseline)
- Quantifiable – Emerging measure flexibility
- Enforceable – Voluntary measure flexibility
- Permanent – Within SIP timeframe

- Other requirements:
- No backsliding
- Emissions are in all applicable inventories

Voluntary and Emerging Measures

Policy: Heat Island Reduction Quotes

- 11. What sources may be covered under these emission reduction strategies?
- Certain stationary sources that indirectly affect ambient air concentrations of criteria pollutants, such as *lighter colored road asphalt*, reflective roofs, strategic tree planting or energy efficiency measures.
- 24. What are examples of emerging measures under development?
- B. Activities that improve air quality by means other than emission reductions, *such as heat island measures that reduce criteria pollutant concentrations by lowering ambient temperatures.*

Voluntary and Emerging Measures

Policy: Heat Island Reduction Quotes

- 26. How should a SIP authority calculate the emissions reductions from an emerging measure?

Certain types of emerging programs may rely on measures that do not directly reduce emissions of pollutants. They may result in less formation of pollution (e.g., *heat island reduction measures* reduce temperature which can result in less ozone formation) ... Estimating pollutant reductions for programs of this type will generally rely on *ambient air quality modeling based* on the application of the best available scientific and engineering information.

Voluntary and Emerging Measures

Policy: Heat Island Reduction Quotes

- 27. How should a State evaluate the emission reduction effectiveness of these programs?
- For example, heat island reduction (HIR) measures require actions to increase the reflectivity of roofs, *roads, and pavement*. Although these are not direct measures of ozone reduction, they are necessary actions to implement a heat island reduction strategy and can be directly measured and compared to the original assumptions in the HIR strategy and modeling. At the same time, the HIR modeling should be updated to reflect any better science or new information available regarding the efficacy of HIR as an ozone reduction strategy.
- 31. What are examples of types of stationary source voluntary measures?
- ... *Heat island programs* to encourage activities that will reduce center-city temperatures during the summer ...

EPA's New Guidance on SIP Credit for EE/RE

- Supports efforts to include EE/RE projects, policies and programs into SIPs
- Guidance includes:
 - General information and background
 - Step-by-step procedure
 - List of tools and resources
 - Examples of proposed SIP submissions

4 Steps in Guidance

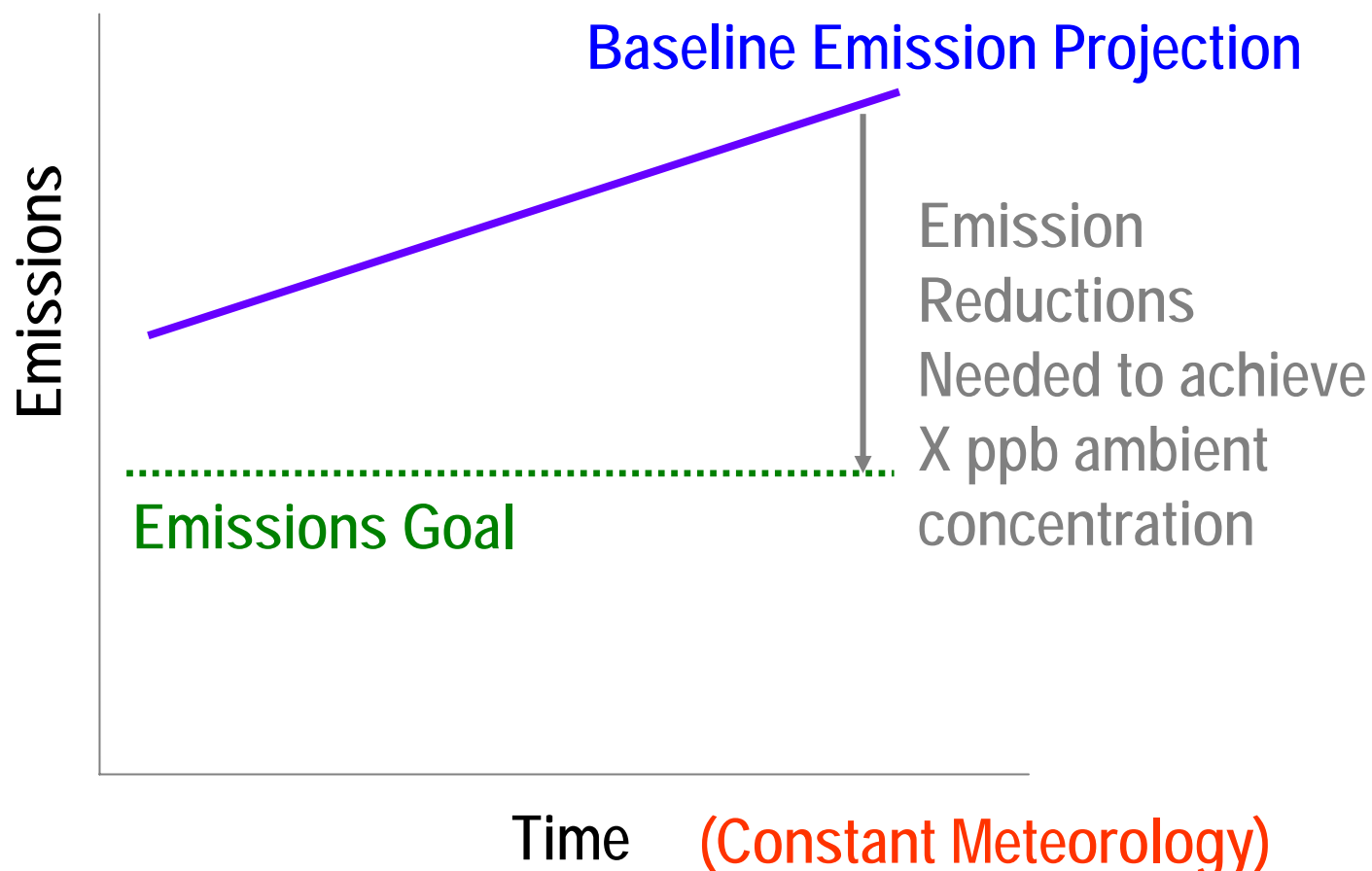
Quantification steps:

- Estimate energy savings from energy efficiency and/or renewable energy generation
- Convert into emission reduction
 - Electricity dispatch consideration
 - Location of reductions is important
- Impact on AQ – directionally correct?
- Verification of activity of measure and associated emission reductions
 - Initial examination 6 months after measure in place for year or ozone season

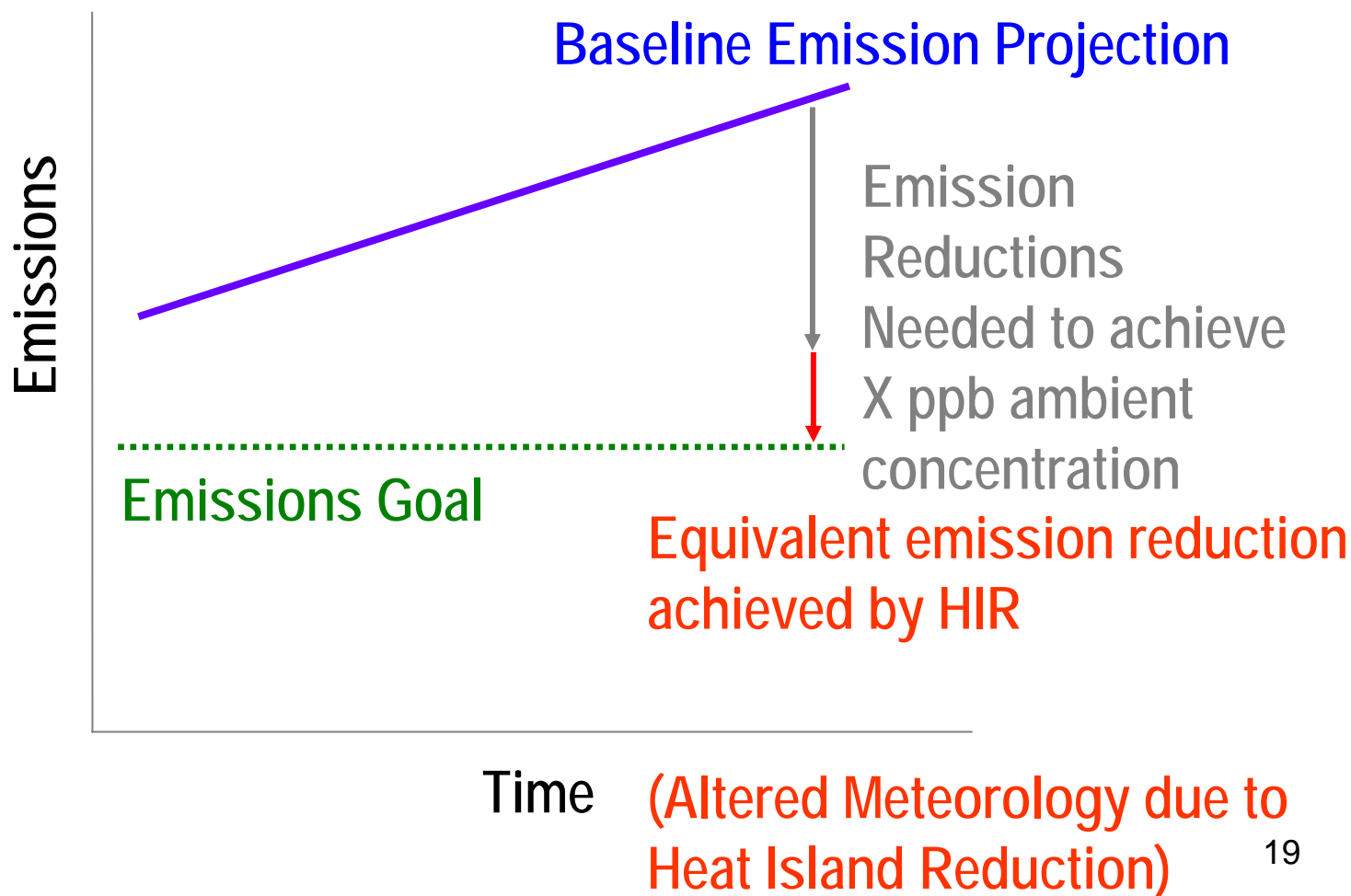
Potential Measures for SIP Credit

- System Benefit Charge Programs
- Renewable Portfolio Standards
- Energy Codes
- Appliance Standards
- Gov. purchase
 - Green Power
 - EE equipment standards
- Utility run Demand Side Management Programs
- ***Heat Island Measures:***
 - ***Reflective roofs***
 - ***Tree canopy & urban forestry***
 - ***Cool pavements***
 - ***Green roofs***
- More ...

Traditional SIP Focus: What's the needed change in emissions?



Adding Heat Island Measures to SIP Process



Heat Island Reduction Measures in SIPs

	Direct Energy Savings	Indirect Energy Savings	Temperature effects on Air Quality
Cool roofs	✓	?	AQM
Urban Forestry	✓	?	AQM
Pavement	X	?	AQM

✓ = quantifiable & verifiable emission reductions

? = possibly quantifiable & verifiable emission reductions

AQM = Air Quality Modeling needed

Bundled Measures Policy

- Inspired in part by MD SIP. See EPA proposed approval at 69 FR 76889, 12/23/2004
- Covers Stationary, Area, and Mobile Sources
 - S&A = 6% under Emerging and Voluntary Measures Policy
 - M = 3% under Mobile Source Voluntary Measures Policy
- Concept: “Bundle” lots of small measures together, total bundle needs to perform as predicted, rather than each individual measure
- Under development (OAQPS), expected this Summer

Other Information & References

- Work with Regional EPA Office during program development to maximize approvability
- Links to documents (www.epa.gov/ttn OAP&G -Title I):
 - Emerging & Voluntary Measures Policy
 - http://www.epa.gov/ttn/oarpg/t1/memoranda/evm_ievm_g.pdf
 - SIP Credits for EERE Measures
 - http://www.epa.gov/ttn/oarpg/t1/memoranda/ereseerem_gd.pdf

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